

**A method and apparatus for printing information on a page containing  
preprinted objects**

**FIELD OF THE INVENTION**

5       The field of this invention relates to digital devices.

**BACKGROUND OF THE INVENTION**

Many people have a desire to print letters and documents on their personal or  
business stationery or letterhead (see figure 5). Currently they have to measure or  
10   guess the location and size of the letterhead, motifs, monograms, and any other  
devices or objects located on their stationery. Then they try to format the letter or  
document they wish to print to avoid these devices. This is typically a trial and error  
process where the user adjusts the formatting and then does a trial print onto the  
stationery or letterhead. This is time consuming and can waste the expensive  
15   stationery.

Therefore there is a need for a device that can scan a page, detect the size and  
location of the devices on the page, and then print the letter or document correctly  
formatted for the scanned page.

20       **SUMMARY OF THE INVENTION**

A method and apparatus is disclosed that can scan a page, detect the location  
and size of any devices or objects on the page, and then print information onto the  
page without printing the information onto the located devices.

Other aspects and advantages of the present invention will become apparent  
25   from the following detailed description, taken in conjunction with the accompanying  
drawings, illustrating by way of example the principles of the invention.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a flow chart for an example embodiment of the present invention.

5        Figure 2 is a flow chart for second example embodiment of the present invention.

Figure 3 is a block diagram of a computer system that could implement an example embodiment of the present invention.

Figure 4 is a block diagram of a scanner printer combination that could  
10       implement an example embodiment of the present invention.

Figure 5 is a sample page of stationery.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

In one example embodiment of the current invention, a page is scanned (102).

15       The page may contain a letterhead, motifs, monograms, logos, a border, images, or other types of devices or objects. The location and size of these devices or objects are detected (104) using page decomposition software. Page decomposition software is well known in the arts, for example see U.S. patent number 5,596,655 "Method for finding and classifying scanned information" by Patricia D. Lopez, which is hereby  
20       incorporated by reference. Once the size and location of the devices on the page have been determined, information is aligned to fit onto the page without overlapping any of the detected devices (106). The aligned information may be in a textual format. The aligned information may be graphical in nature. Or the aligned information may be a combination of text and graphics. Once the information has been aligned, the  
25       information is printed onto the page (108). The page may be the same page that was

scanned, or it may be a page formatted similarly to the scanned page. Optionally, the size and location of the detected devices or objects are saved to a file to create a template (216). The template can be used to align and print additional information to copies of the scanned page without having to re-scan the page each time.

5           In one example embodiment of the current invention, the information to be printed is retrieved from a file (212). In another example embodiment of the current invention, the information to be printed onto the page is scanned from a different page (210). If the information scanned from the different page is textual in nature, then in the preferred embodiment, the information will be converted from the scanned bitmap  
10   into text using optical character recognition (OCR) software. Once converted into text, the text will be aligned to fit onto the page. In another example embodiment of the current invention, the information to be printed is sent from a program (not shown), typically a word processing program.

          Figure 3 shows a computer system (302) with a printer (304) and a scanner  
15   (306) attached to the computer system. The scanner (306) is connected to the computer (302) with an I/O bus (308). The printer (304) is connected to the computer (302) with an I/O bus (310). I/O bus 308 and 310 may be a USB bus, a SCSI bus, a fire-wire bus, a parallel interface, or the like. In one example embodiment of the current invention, a page containing objects or devices is scanned using the scanner  
20   (306). Software running on the computer (302) may be used to control the scanner (306). Devices or objects located on the scanned page are detected. The devices or objects may be detected by the scanner (306) or they may be detected with software running on the computer (302). Once the location and size of the devices or objects have been determined, information is formatted such that the information will not  
25   encroach onto the located devices or objects when printed onto the page. The

adjustment of the information may occur in the computer (302) or it may occur in the printer (304). Once the information has been aligned, the information is printed onto the page. In one example embodiment of the current invention, the user is prompted to move the scanned page from the scanner (306) to the printer (304) so that the  
5 information can be printed onto the same page that was scanned. In another example embodiment of the current invention, a second page with the same devices or objects, is used to receive the aligned information. Optionally, the size and location of the detected devices or objects may be saved on the computer (302) as a template.

In one example embodiment of the current invention, the information is  
10 retrieved from a file located on the computer (302). In another example embodiment of the current invention, the information is located in a program running on the computer (302), typically a word processing program. In another example embodiment of the current invention, a second page is scanned to capture the information contained on the page. The computer (302) may be connected to a  
15 network or the Internet with a communication link (not shown). The communication link may be a modem, a broad band connection, or the like. In another example embodiment, the information to be aligned may be downloaded from the Internet using the communication link.

Figure 4 shows a printer (402) connected to a scanner (404) with an I/O bus  
20 (408). The printer (402) is also connected to a network, for example the Internet, (not shown) with an I/O bus (406). The connection to the network could also be attached to the scanner (404). I/O bus 406 and 408 may be a USB bus, a SCSI bus, a fire-wire bus, a parallel interface, or the like. In one example embodiment of the current invention, a page is scanned using the scanner (404). Devices or objects located on the  
25 scanned page are detected. Once the location and size of the devices or objects have

been determined, information is formatted such that the information will not overlap onto the located devices or objects when printed onto the page. The adjustment of the information may occur in the scanner (404) or it may occur in the printer (402). Once the information has been aligned, the information is printed onto the page. In one  
5 example embodiment of the current invention, the user is prompted to move the scanned page from the scanner (404) to the printer (402) so that the information can be printed onto the same page that was scanned. In another example embodiment of the current invention, the aligned information is printed onto a second page with the same formatting as the scanned page. Optionally, the size and location of the detected  
10 devices or objects may be saved on the network (302) as a template. In another example embodiment of the current invention, the scanner and printer may be combined into one device, for example an all-in-one device (not shown).

The foregoing description of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit  
15 the invention to the precise form disclosed, and other modifications and variations may be possible in light of the above teachings. The embodiment was chosen and described in order to best explain the principles of the invention and its practical application to thereby enable others skilled in the art to best utilize the invention in various embodiments and various modifications as are suited to the particular use  
20 contemplated. It is intended that the appended claims be construed to include other alternative embodiments of the invention except insofar as limited by the prior art.